de maximis, inc.

TO:	Stephanie Vaughn	***CC:***	Rob Law (*de maximis*)
			Gary Foster (CH2M Hill)
FROM:	Stan Kaczmarek		Bill Potter (*de maximis*)
DATE:	July 29, 2013		
RE:	Response to July 25 EPA Questions on River Flows vs Silt Curtain Capabilities		

Summary

In response to EPA concerns about the relationship between river flow and silt curtain capabilities, Great Lakes Dredge and Dock (GLDD) has determined that their silt curtain installation will be effective to at least 2 knots, and CPG has determined that a 2 knot current at the Removal Area will occur only when Dundee Dam discharge is on the order of 6000 cfs. Earlier statements during the project design stage assumed that silt curtains would be effective to 1.5 knots which is equivalent to a 4000 cfs Dundee Dam discharge.

Details

During the EPA-CPG meeting on July 25, EPA suggested (1) that dredging should be suspended when Dundee Dam discharge exceeds 4,000 cfs, and (2) that pre-dredge turbidity data should be filtered to exclude turbidity values obtained when the Dundee Dam discharge was higher than this value. The basis for this recommendation appears to be the following Best Management Practice listed in CH2M-Hill's May 22 Technical Memorandum on Resuspension Management (attached) previously submitted to EPA and NJDEP:

- Monitor the river velocity and suspend operations when the velocity increases above the effective velocity of a silt curtain system (1.7 to 2.5 ft/sec) which based on historical data would only happen during a significant storm event on the order of 4,000 cfs or greater.

The intention was to suspend work when flow velocity exceeded the silt curtain design capacity. The limits stated, 1.7 to 2.5 ft/sec (equivalent to 1 to 1.5 knots), were obtained from US Army Corps of Engineers general literature on silt curtain systems (September 2008, Technical Guidelines for Environmental Dredging of Contaminated Sediments, ERDC/EL TR-08-29), and not from the manufacturer's specification for the silt curtain that will be actually deployed for the Removal Action; the silt curtain had not been selected prior to the submission of the May 25 memorandum. The 4,000 cfs Dundee Dam discharge cited in the memorandum results in an estimated 1.5 knot flow velocity during ebb flows at the edge of the Removal Area.

Subsequently, GLDD has selected a silt curtain deployment that is designed for velocities up to at least 2 knots. A 2 knot velocity is estimated during ebb flows with a Dundee Dam discharge of 6,000 cfs. An explanation of how Dundee Dam discharge is used to estimate flow velocities adjacent to the silt curtain at the Removal Area is described in a Moffatt & Nichol memorandum (attached).

Secondly, CPG believes that it is not necessary to filter-out data collected in excess of 4,000 cfs during the June pre-dredge survey data on turbidity when determining appropriate trigger and action turbidity values for monitoring re-suspension. Therefore CPG stands behind its recommendations contained in its July 15 technical memorandum on setting trigger values (also attached). Furthermore, CPG believes that cessation of dredging should primarily be based on turbidity measurements as described in the Water Quality Monitoring Plan.

Finally, CPG requests EPA's response to the Suspended Solids Concentration – Turbidity Correlations tech memo July 15, 2013 where it was shown that suspended solids concentration (SSC) and turbidity had a high degree of correlation for the pre-dredge baseline period and was statistically similar to previous correlations of historical data. Given the high degree of correlation and the consistent correlations between historical and recent data, the collection of more SSC data for correlation purposes is not warranted. Therefore, the CPG proposes to reduce a portion of the initial dredging monitoring and routine monitoring as shown below with strikethrough of EPA's May 31st outline.

Initial Dredging Monitoring (first 48 hours)

Purpose: intensive sampling to (1) identify any unpredicted impacts to surface water quality; (2) gain experience in implementing the monitoring program; (3) ~~attempt to verify turbidity-TSS-COPC correlations;~~ (4) identify any needed revisions to the monitoring program; and (5) identify any revisions to dredging and capping operations to minimize surface water quality impacts.

a. Collect samples every 2 hours at ~~surface and~~ mid-depth at buoys #1, #2, #3, and #4 over an 8-hour period each day.
b. Analyze each sample for ~~TSS and~~ turbidity:
    - 2 days x 4 sites x 1~~2~~ depth~~s~~ x 5 samples = 4~~8~~0 ~~TSS and~~ turbidity samples

c. Create one composite sample (from individual samples collected every 2 hours) for each buoy location each day to analyze for POC, DOC, TSS and COPCs (need 2L sample for PCDD/F analysis):
    - 2 days x 4 sites = 8 COPC, POC, DOC, and TSS composite samples

d. Buoy #5 Plume Tracking – if a p lume of suspended sediment is observed, determine the horizontal and vertical extent of the plume by measuring turbidity along suitably -spaced horizontal transects and profiling the water column.
e. Implement a similar monitoring effort during the first 48 hours of the capping operation.
f. Note 1: As appropriate, refine previous determination of whether it is acceptable to sample only at mid-depth locations in the water column during the rest of the dredging and capping program.
g. Note 2: If sampling indicates that there are consistent vertical (surface, mid-depth) differences in turbidity and TSS at a buoy location, the planned sample compositing scheme for COPC analysis during dredging and capping may have to be revised.

Routine Dredging Monitoring

Purpose: To continually determine real -time turbidity levels in and outside the RM 10.9 project area during dredging and capping operations. To obtain periodic COPC data for comparison to SWQC.

a. Turbidity – continuous at mid -depth, to be refined as necessary based on previous determinations.
b. Weekly synoptic (i.e. as close as practical during the same portion of the tidal cycle) transect sampling at Buoys #1, #2, #3, and #4:
    - 1~~3~~ sampling locations at each buoy (mid-channel~~, 50 feet off each shoreline~~)
    - Collect samples from 1~~2~~ depths – ~~surface minus 1 foot and~~ mid-depth
    - Analyze each of these samples for TSS, POC, DOC, COPCs and Turbidity (in situ):
        - 4 sites x 1~~3~~ location~~s~~/transect x 1~~2~~ depth~~s~~/transect
            = ~~2~~4 TSS, POC, DOC, COPCs and Turbidity (in situ) samples
    - ~~Combine 16 equal volume water samples to create one composite sample at each sampling location to analyze for TSS, POC, DOC, and COPCs (need 2L sample for PCDD/F analysis):~~
        - ~~4 COPC, POC, DOC, and TSS composite samples per week~~

c. ~~Note 1: if sampling indicates that there are consistent vertical (surface, mid -depth) differences in turbidity and TSS at a buoy location, the planned sample compositing scheme for COPC analysis may have to be revised.~~ Buoy #5 Plume Tracking – if a plume of suspended sediment is observed, determine the horizontal and vertical extent of the plume by measuring turbidity along suitably-spaced horizontal transects and profiling the water column.